What is claimed is:

1. An apparatus for measuring a spectral distribution of a narrow-band laser beam generated by a line-narrowed excimer laser or a molecular fluorine laser system, comprising:

an interferometric device disposed along an optical path of an output beam of the laser system such that the beam traverses the interferometric device on a first pass;

a retro-reflector disposed after the interferometric device along said optical path for retro-reflecting the beam back through the interferometric device on a second pass; and

a detector for detecting an intensity of the beam after the second pass through the interferometric device, and

wherein spectral information is determined when the wavelength of the laser system is tuned and the detector measures the intensity of the beam at a plurality of wavelengths.

2. The apparatus of Claim 1, wherein the detector includes a photodiode.

3. The apparatus of Claim 1, further comprising a light guidance cable, wherein the beam is directed towards the interferometric device through the light guidance cable.

4. The apparatus of Claim 3, wherein the light guidance cable includes a fiber optic.

5. The apparatus of Claim 3, further comprising a beam expander for expanding the beam after traversing the light guidance cable and before being incident upon the interferometric device.

6. The apparatus of Claim 3, further comprising a focusing lens, wherein the output beam is focused onto an input face of the light guidance cable by the lens.

7. The apparatus of Claim 3, wherein the beam makes a third interferometric pass prior to being incident upon the detector.

8. The apparatus of Claim 7, further comprising a second retro-reflector disposed after the first retro-reflector along the optical path of the beam, and after the beam has traversed the interferometric device on the second pass, the second retro-reflector for retro-reflecting the beam back through the interferometric device on the third pass.

9. The apparatus of Claim 1, wherein the beam makes a third interferometric pass prior to being incident upon the detector.

10. The apparatus of Claim 9, further comprising a second retro-reflector disposed after the first retro-reflector along the optical path of the beam, and after the beam has traversed the interferometric device on the second pass, the second retro-reflector for retro-reflecting the beam back through the interferometric device on the third pass.

11. The apparatus of Claim 1, wherein the apparatus is configured such that line broadening due to divergency is less than 0.1 times the passive bandwidth of the single pass interferometric device.

12. The apparatus of Claim 1, wherein the apparatus is configured such that line shift due to deviations of incident angles of the first and second passes is less than 0.1 times the passive bandwidth of the single pass interferometric device.

13. The apparatus of Claim 1, wherein the apparatus is configured such that line broadening due to divergency and line shift due to deviations of incident angles of the first and second passes are in combination less than 0.1 times the passive bandwidth of the single pass interferometric device.

14. An apparatus for measuring a spectral distribution of a narrow-band laser beam generated by a line-narrowed excimer laser or a molecular fluorine laser system, comprising:

an interferometric device disposed along an optical path of an output beam of the laser system such that the beam traverses the interferometric device on a first pass;

a retro-reflector disposed after the interferometric device along said optical path for retro-reflecting the beam back through the interferometric device on a second pass; and

a detector for detecting an intensity of the beam after the second pass through the interferometric device, and

wherein spectral information is determined when the free spectral range of the interferometric device is tuned and the detector measures the intensity of the beam at a plurality of free spectral ranges.

15. The apparatus of Claim 14, wherein the detector includes a photodiode.

16. The apparatus of Claim 14, further comprising a housing within which the interferometric device is disposed, and wherein the free spectral range of the interferometric device is tuned by varying a pressure within the housing.

17. The apparatus of Claim 14, further comprising a light guidance cable, wherein the beam is directed towards the interferometric device through the light guidance cable.

18. The apparatus of Claim 17, wherein the light guidance cable includes a fiber optic.

19. The apparatus of Claim 17, further comprising a beam expander for expanding the beam after traversing the light guidance cable and before being incident upon the interferometric device.

20. The apparatus of Claim 17, further comprising a focusing lens, wherein the output beam is focused onto an input face of the light guidance cable by the lens.

21. The apparatus of Claim 17, wherein the beam makes a third interferometric pass prior to being incident upon the detector.

22. The apparatus of Claim 21, further comprising a second retro-reflector disposed after the first retro-reflector along the optical path of the beam, and after the beam has traversed the interferometric device on the second pass, the second retro-reflector for retro-reflecting the beam back through the interferometric device on the third pass.

23. The apparatus of Claim 14, wherein the beam makes a third interferometric pass prior to being incident upon the detector.

24. The apparatus of Claim 23, further comprising a second retro-reflector disposed after the first retro-reflector along the optical path of the beam, and after the beam has traversed the interferometric device on the second pass, the second retro-reflector for retro-reflecting the beam back through the interferometric device on the third pass.

25. The apparatus of Claim 14, wherein the apparatus is configured such that line broadening due to divergency is less than 0.1 times the passive bandwidth of the single pass interferometric device.

26. The apparatus of Claim 14, wherein the apparatus is configured such that line shift due to deviations of incident angles of the first and second passes is less than 0.1 times the passive bandwidth of the single pass interferometric device.

27. The apparatus of Claim 14, wherein the apparatus is configured such that line broadening due to divergency and line shift due to deviations of incident angles of the first and second passes are in combination less than 0.1 times the passive bandwidth of the single pass interferometric device.

28. An apparatus for measuring a spectral distribution of a narrow-band laser beam generated by a line-narrowed excimer laser or a molecular fluorine laser system, comprising:

an interferometric device disposed along an optical path of an output beam of the laser system such that the beam traverses the interferometric device on a first pass;

a retro-reflector disposed after the interferometric device along said optical path for retro-reflecting the beam back through the interferometric device on a second pass;

a detector for detecting an intensity of the beam after the second pass through the interferometric device; and

a light guidance cable for directing the beam towards the interferometric device.

29. The apparatus of Claim 28, wherein the light guidance cable includes a fiber optic.

30. The apparatus of Claim 28, further comprising a beam expander for expanding the beam after traversing the light guidance cable and before being incident upon the interferometric device.

31. The apparatus of Claim 28, further comprising a focusing lens, wherein the output beam is focused onto an input face of the light guidance cable by the lens.

32. An apparatus for measuring a spectral distribution of a narrow-band laser beam generated by a line-narrowed excimer laser or a molecular fluorine laser system, comprising:

an interferometric device disposed along an optical path of an output beam of the laser system such that the beam traverses the interferometric device on a first pass;

a retro-reflector disposed after the interferometric device along said optical path for retro-reflecting the beam back through the interferometric device on a second pass;

a detector for detecting an intensity of the beam after the second pass through the interferometric device, and

wherein the beam makes a third interferometric pass prior to being incident upon the detector.

33. The apparatus of Claim 32, further comprising a second retro-reflector disposed after the first retro-reflector along the optical path of the beam, and after the beam has traversed the interferometric device on the second pass, the second retro-reflector for retro-reflecting the beam back through the interferometric device on the third pass.

34. The apparatus of Claim 32, wherein the apparatus is configured such that line broadening due to divergency is less than 0.1 times the passive bandwidth of the single pass interferometric device.

35. The apparatus of Claim 32, wherein the apparatus is configured such that line shift due to deviations of incident angles of the first and second passes is less than 0.1 times the passive bandwidth of the single pass interferometric device.

36. The apparatus of Claim 32, wherein the apparatus is configured such that line broadening due to divergency and line shift due to deviations of incident angles of the first and second passes are in combination less than 0.1 times the passive bandwidth of the single pass interferometric device.

37. The apparatus of Claim 32, further comprising a light guidance cable, wherein the beam is directed towards the interferometric device through the light guidance cable.

38. The apparatus of Claim 37, wherein the light guidance cable includes a fiber optic.

39. The apparatus of Claim 37, further comprising a beam expander for expanding the beam after traversing the light guidance cable and before being incident upon the interferometric device.

40. The apparatus of Claim 37, further comprising a focusing lens, wherein the output beam is focused onto an input face of the light guidance cable by the lens.

41. An apparatus for measuring a spectral distribution of a narrow-band laser beam generated by a line-narrowed excimer laser or a molecular fluorine laser system, comprising:

an interferometric device disposed along an optical path of an output beam of the laser system such that the beam traverses the interferometric device on a first pass;

a retro-reflector disposed after the interferometric device along said optical path for retro-reflecting the beam back through the interferometric device on a second pass; and

a detector for detecting an intensity of the beam after the second pass through the interferometric device, and

wherein spectral information is determined and the detector makes a plurality of measurements of the intensity of the beam when the interferometric device is tuned.

42. The apparatus of Claim 41, wherein the interferometric device includes an etalon.

43. The apparatus of Claim 41, wherein the interferometric device is tuned by adjusting the gas pressure between reflecting surfaces of the interferometric device.

44. The apparatus of Claim 43, wherein the plurality of measurements are made by the detector at a plurality of gas pressures between the reflecting surfaces of the interferometric device.

45. The apparatus of Claim 41, wherein the beam makes a third interferometric pass prior to being incident upon the detector.

46. The apparatus of Claim 45, further comprising a second retro-reflector disposed after the first retro-reflector along the optical path of the beam, and after the beam has traversed the interferometric device on the second pass, the second retro-reflector for retro-reflecting the beam back through the interferometric device on the third pass.

47. The apparatus of Claim 41, wherein the apparatus is configured such that line broadening due to divergency is less than 0.1 times the passive bandwidth of the single pass interferometric device.

48. The apparatus of Claim 41, wherein the apparatus is configured such that line shift due to deviations of incident angles of the first and second passes is less than 0.1 times the passive bandwidth of the single pass interferometric device.

49. The apparatus of Claim 41, wherein the apparatus is configured such that line broadening due to divergency and line shift due to deviations of incident angles of the first and second passes are in combination less than 0.1 times the passive bandwidth of the single pass interferometric device.